The Increase in Unemployment Since 2007: Is It Cyclical or Structural?

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January 24, 2013

Congressional Research Service
7-5700
www.crs.gov
R41785

CRS Report for Congress
Prepared for Members and Committees of Congress

Summary

The unemployment rate greatly increased after the onset of the latest recession in December 2007, when it measured 5.0%. The rate peaked at 10.0% in October 2009, four months after the recession's official end in June 2009. More than three years into the recovery, the unemployment rate averaged 8.1% in 2012. Given its still elevated level, policymakers may continue to be concerned about how to spur economic growth and create jobs.

Over the past few years, Congress has used fiscal policy and the Federal Reserve (Fed) has used monetary policy to put the economy on a path toward the level of demand for goods and services that preceded the 2007-2009 recession. Firms react to recessions by laying off workers, and the deeper the downturn in the business cycle, the greater the rise in unemployment that results. Expansionary fiscal and monetary policies commonly have been used to remedy what is known as cyclical unemployment.

The unemployment rate has not been as responsive as had been hoped to the countercyclical measures undertaken by Congress and the Fed. Consequently, some have suggested that an increase in another type of unemployment—referred to as structural unemployment—has accounted for much of the rise in the unemployment rate from pre-recession levels. These observers assert that the rise in unemployment due to change in the structure of the economy represents "a new normal" of elevated unemployment rates for years to come.

Structural unemployment develops for different reasons than cyclical unemployment. Structural unemployment results when jobseekers do not move quickly into vacant jobs. Obstacles that lengthen the spell of unemployment (i.e., prolong the period of job search) include mismatches between the skills or locations of jobless workers and the skill requirements or locations of available jobs. Another impediment is the composition of the unemployed, such as more workers whose connection to their former employers is permanently severed (i.e., fewer workers likely to be recalled from layoffs once business revives at their former employers). A third factor that may contribute to long-term unemployment is known as labor market institutions, such as unemployment benefit programs.

The measures enacted by Congress have chiefly focused on alleviating cyclical unemployment. To the extent that the still-high unemployment rate results from the slow pace of output growth during the recovery, economic theory suggests that fiscal and monetary stimulus would be suitable strategies for further reducing joblessness. To the extent that structural factors have contributed to the still-high unemployment rate, economic theory suggests measures such as promoting the education and retraining of workers who permanently lost jobs in hard-hit industries (e.g., home building) so that they can acquire the skills needed to obtain employment in other industries.

This report assesses the relative magnitudes of cyclical and structural unemployment as they respond to different policy measures. An analysis of changes since 2007 in a variety of labor market indicators across industries and areas finds patterns that strongly suggest most of the increase in the U.S. unemployment rate is cyclical (i.e., due to depressed aggregate demand). Empirical studies suggest that, although structural unemployment has temporarily increased, it accounted for a minority of the rise in the unemployment rate in recent years.

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Introduction

During the past few years, economists have been debating how much of the increase in unemployment since the start of the 2007-2009 recession is due to reduced demand for goods and services compared with compositional changes entailing worker reallocation across industries and areas.[1] In other words, how much of the increase in the official unemployment rate from 5.0% at the recession's outset in December 2007 to a peak of 10.0% in October 2009 was cyclical unemployment and how much was structural unemployment?

Distinguishing cyclical from structural unemployment is more than an academic exercise. Their relative contribution to the increase in the unemployment rate since 2007 has different implications for the pace at which the economy can grow without spurring inflation and for which public policies are most appropriate to lower an unemployment rate that remains elevated long after the latest recession's end in June 2009.

Many workers who became unemployed during the 2007-2009 recession are expected to return to jobs in their former industries as demand for the goods and services they previously produced grows during the recovery phase of the business cycle. Fiscal and monetary policies often have been used to jump-start aggregate demand and job growth for the cyclically unemployed. In response to the latest recession, for example, recent Congresses enacted multiple measures to stimulate demand and promote job creation while the Federal Reserve (Fed) undertook various strategies to mitigate the financial crisis that coincided with the recession and to stimulate economic activity.[2] If the increase in unemployment is largely due to the sluggish pace of output growth since the recession's end, then economic theory suggests that fiscal and monetary stimulus would be suitable strategies for lowering the unemployment rate from its still-elevated average of 8.1% in 2012.

Those workers who permanently lost their jobs during the 2007-2009 recession are expected to experience a longer spell of unemployment than those temporarily laid off until product demand revives in their former sectors of employment. The duration of job losers' unemployment may be further lengthened if the skills they possess do not match the skills required by jobs in growing sectors or if they live in areas different from those experiencing job growth. To overcome skill mismatch for example, displaced workers may require retraining or additional formal education. Congress recognized that different public policies are appropriate for helping structurally unemployed workers return to economically productive activities when it included training provisions among the countercyclical measures in the American Recovery and Reinvestment Act, for example.[3]

Rather than persisting in their search for jobs, some structurally unemployed workers may drop out of the labor force, thereby reducing the supply of labor and the capacity of the economy to

[1] See, for example, James Ledbetter, "Strucs vs. Cycs: The Two Gangs of Economists Warring Over the Causes of High Unemployment," *Slate*, August 24, 2010; and Prajakta Bhide, "The Fed Debates: Is Unemployment Structural or Cyclical?," *Forbes*, October 21, 2010.

[2] For additional information, see CRS Report R41578, *Unemployment: Issues in the 113th Congress*, by Jane G. Gravelle, Thomas L. Hungerford, and Linda Levine.

[3] For additional information, see CRS Report R40182, *Funding for Workforce Development in the American Recovery and Reinvestment Act (ARRA) of 2009*, by David H. Bradley and Ann Lordeman.

grow in the long run.[4] A smaller labor force also reduces income tax payments and imposes additional costs on society. For example, because older workers, the partially disabled and less educated are among those most likely to stop participating in the labor force, early claiming of Society Security retirement benefits and entering the Social Security Disability Income program could increase.[5]

Given the different implications of cyclical and structural unemployment for policymakers, this report distinguishes between the relative magnitude of the two in recent years. Before conducting this analysis, the report defines a few concepts that will help the reader navigate the remainder of the report.

A Few Concepts Briefly Explained

Economists often break down unemployment into three types: frictional, structural, and cyclical.

- *Frictional* unemployment arises from the ever-present movement of people into and out of jobs. Examples include the unemployment of college graduates while searching for their first jobs, of family caregivers returning to the labor force, and of workers who quit jobs before having found new ones. Both frictional and structural unemployment involve the worker-to-job matching process. Two distinctions between them are the voluntary nature of some frictional unemployment and its shorter duration compared with structural unemployment.
- *Structural* unemployment arises from obstacles to the worker-to-job-matching process that lengthen unemployment spells. Impediments to unemployed workers quickly moving to firms with available jobs include mismatches (between the skills or locations of jobless workers and the skill requirements or locations of available jobs), the composition of the unemployed (toward workers who permanently lost jobs vis-a-vis workers temporarily laid off, for example), and the characteristics of labor market institutions (such as the wage-replacement rate and duration of unemployment benefits).
- *Cyclical* unemployment arises when the economy experiences a decrease in the demand for goods and services. Employers adjust to a downturn in the business cycle by temporarily laying off workers and cutting the hours of employees retained to fill reduced product demand. When demand starts to revive, firms may be reluctant to immediately resume hiring and may first increase the hours of their existing work force. Once firms feel confident that economic growth will continue, they recall the experienced workers laid off during the recession.

[4] Trend or potential economic (output) growth is dependent on the supply of labor and on productivity growth. For additional information, see CRS Report R42063, *Economic Growth and the Unemployment Rate*, by Linda Levine.

[5] Testimony of Till von Wachter, associate professor of Economics, Columbia University, in U.S. Congress, Senate Budget Committee, *Challenges for the U.S. Economic Recovery*, 112th Cong., 1st sess., February 3, 2011.

Under certain conditions, however, cyclical unemployment may evolve into structural unemployment. If the economy grows slowly for an extended period after a recession's end and causes the unemployment rate to remain high for quite some time, then some of what began as cyclical unemployment may become structural unemployment. The following is an example of how this occurs. By definition, the skills of the cyclically unemployed at the outset of their displacement match the skills demanded by employers. But the longer these workers remain jobless, the greater the likelihood their skills will become rusty. As economic growth strengthens and firms start hiring workers, the skills of the long-term unemployed may have so deteriorated that they no longer match the skill requirements of available jobs.

Frictional, structural, and cyclical unemployment are not directly measured, but policy analysts have estimated the nonaccelerating inflation rate of unemployment (NAIRU). Because the NAIRU is estimated without regard to fluctuations in aggregate demand (i.e., without regard to the business cycle), it commonly is used as a proxy for the structural unemployment rate. The NAIRU or natural rate of unemployment reflects the extent of long-term slack in the labor market, which is helpful to know when formulating policy. For example, a substantial increase in structural unemployment implies that there is much less excess labor (capacity) in the economy. Consequently, the Fed cannot reduce the official unemployment rate as much as it previously could without raising the inflation rate.

Cyclical vs. Structural Unemployment

Based on the following analysis of changes in multiple labor market indicators by industry and area, a majority of the increase in unemployment between the 2007-2009 recession's onset and its peak in 2010 appears to be cyclical. As discussed in detail below, this finding is supported by several empirical studies which estimated that any increase in structural unemployment that occurred accounted for a minority of the rise in the U.S. unemployment rate. The results do not suggest that the nation is facing a "new normal" of elevated unemployment rates for years to come.

Evidence of Greatly Increased Cyclical Unemployment

> The mismatch argument for sustained increases in the unemployment rate and the NAIRU is predicated on imbalances in labor supply and demand across sectors and skill groups. The extent of such imbalances can be assessed by examining employment growth and unemployment rates across industry sectors, states, and occupations.[6]

This approach is pursued below using annual average data from 2007 to 2010, the year in which the unemployment rate peaked at 9.6%.

[6] Rob Valletta and Katherine Kuang, "Is Structural Unemployment on the Rise?," *FRBSF Economic Letter*, No. 2010-34, November 8, 2010, p. 3. (Hereinafter cited as Valletta and Kuang, *Is Structural Unemployment on the Rise?*.)

Job Loss by Industry and Unemployment Rates by State

The 7.8 million jobs lost between 2007 and 2010 occurred across a broad swath of industries.[7] The number of jobs on employers' payrolls plummeted in 18 of the 24 industries shown in **Figure 1**. Cyclically sensitive industries, such as manufacturing and construction, bore the brunt of job losses during the latest recession just as they did during prior recessions. When aggregate employment stopped declining in March 2010, "the dispersion of employment gains and losses across sectors returned to its pre-recession level, suggesting very little imbalance in the pace of employment growth at that point."[8]

The data displayed in **Figure 1** support DeLong's statement that "What we have witnessed is not a shift in demand into sectors lacking an adequate number of qualified and productive workers, but rather a collapse in the level of aggregate demand."[9] He concluded that, as of fall 2010, evidence was lacking of "labor shortages, rising wages, and increasing prices in expanding sectors, accompanied by high unemployment elsewhere in the economy," which would be the case if skills mismatch was the major explanation for the nation's high unemployment rate. DeLong went on to note, however, that were unemployment to remain high "for two or three more years" then structural unemployment could well become a bigger factor because "nothing converts cyclical unemployment into structural unemployment more certainly than prolonged unemployment."

Just as job losses occurred in most industries between 2007 and 2010, so too did the unemployment rate rise in every state in the nation.[10] The across-the-board increase in unemployment rates suggests that labor demand fell throughout the country, belying the notion of a mismatch between the locations of available jobs and workers desiring employment.

Only two states—Alaska (6,500 jobs) and North Dakota (17,200 jobs)—and the District of Columbia (17,100 jobs) posted net employment gains between 2007 and 2010.[11] This implies that unemployed workers had little incentive to move to find jobs, which does not support speculation that conditions in the housing market dampened the migration rate of unemployed homeowners.

[7] Calculated by CRS from the U.S. Bureau of Labor Statistics' (BLS) Current Employment Statistics (CES) program. National data from the CES program are available at http://stats.bls.gov/ces/.

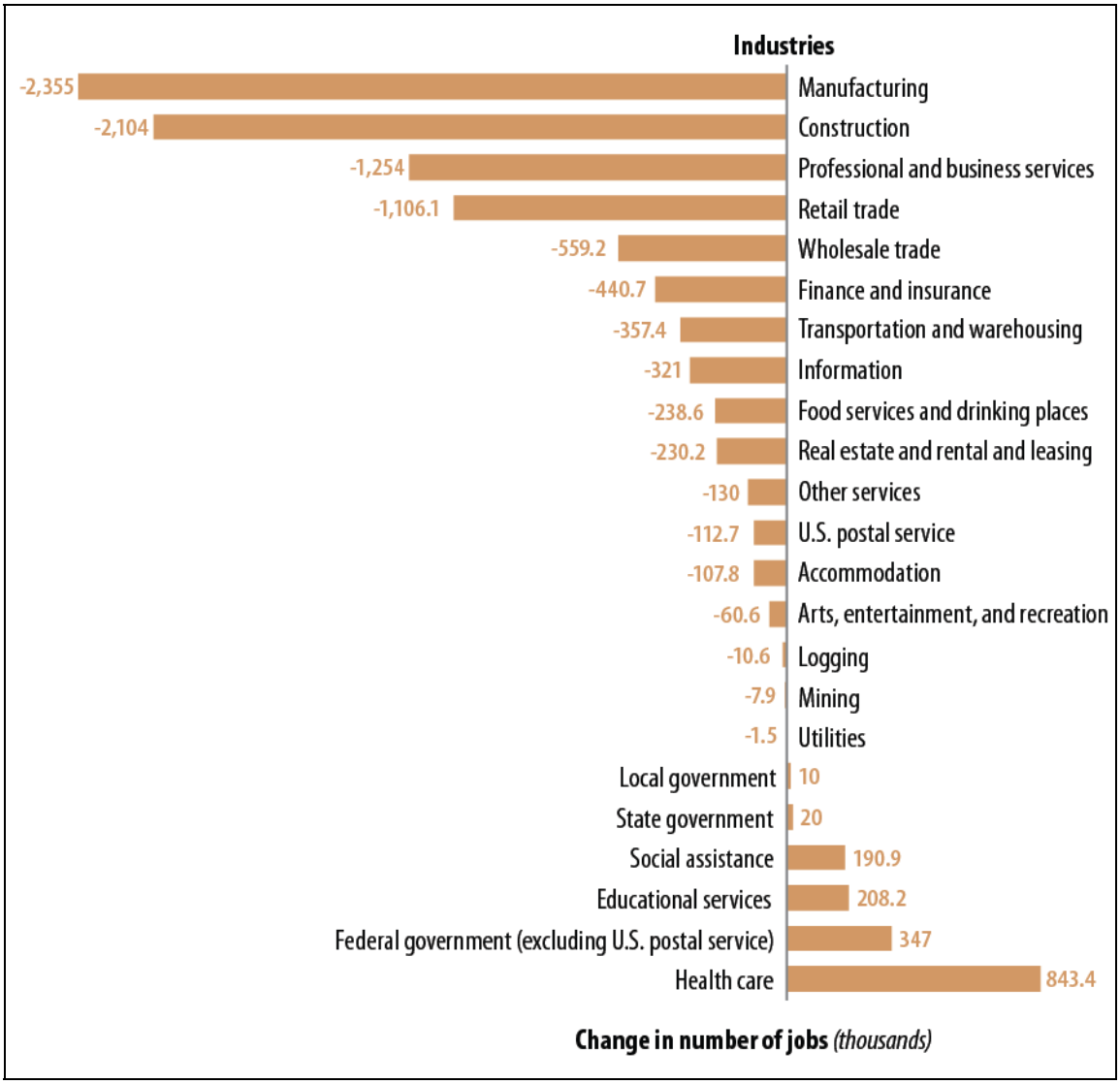
[8] Valletta and Kuang, *Is Structural Unemployment on the Rise?*, p.3.

[9] J. Bradford DeLong, "Is Today's Unemployment Structural?," *The Economists' Voice*, September 2010, http://www.bepress.com/ev.

[10] BLS, Local Area Unemployment Statistics (LAUS) program. LAUS data are available at http://stats.bls.gov/lau/.

[11] CRS calculations from state-by-state employment data available through BLS's Current Employment Statistics program at http://stats.bls.gov/sae/.

Figure 1. Change in the Number of Jobs by Industry, 2007-2010



Source: Created by CRS from the total number of nonfarm jobs in 2007 and 2010, according to U.S. Bureau of Labor Statistics data from the Current Employment Statistics program.

Most empirical analyses also suggest that the state of the housing market is not an especially good explanation for the decrease in geographic mobility since 2007.[12] Molloy, Smith, and Wozniak found neither the housing market contraction nor the 2007-2009 recession to be persuasive

[12] See, for example, Regis Barnichon and Andrew Figura, *What Drives Matching Efficiency? A Tale of Composition and Dispersion*, Federal Reserve Board, Finance and Economics Discussion Series, No. 2011-10, January 9, 2011; Henry S. Farber, "Unemployment in the Great Recession: Did the Housing Market Crisis Prevent the Unemployed from Moving to Take Jobs?," *American Economics Review*, vol. 102, no. 3 (May 2012); Alicia Sasser Modestino and Julia Dennett, *Are American Homeowners Locked into Their Houses? The Impact of Housing Market Conditions on State-to-State Migration*, Federal Reserve Bank of Boston, Working Paper no. 12-1, February 8, 2012; and Sam Schulhofer-Wohl, *Negative Equity Does Not Reduce Homeowners' Mobility*, National Bureau of Economic Research, Working Paper no. 16701, January 2011.

reasons for the recent decrease in internal migration rates.[13] Kaplan and Schulhofer-Wohl determined that the large drop in annual interstate migration rates starting in 2006, which had led some observers to infer a connection to "house lock," was instead the result of a change in the Census Bureau's procedure for imputing missing data in the Current Population Survey (CPS). Kaplan and Schulhofer-Wohl considered the smaller change in migration rates from two other sources (the Census Bureau's American Community Survey and the Internal Revenue Service) to bolster their assessment that interstate migration has not recently decreased to a substantial degree.[14]

Using data from yet another source (the Census Bureau's Survey of Income and Program Participation), Aaronson and Davis estimated that the decrease in state-to-state migration rates during the 2007-2009 recession and the first year of recovery were similar for homeowners and renters and also were similar to their experience during prior recessions. They further found little empirical support for the house lock argument based on the severity of a state's decline in housing prices or the unemployment status of the head of homeowner households.[15]

Schmitt and Warner took a different approach to determining whether differences in housing market conditions by state affected the geographic mobility of job losers. They estimated that the probability of displaced workers' moving over the 2007-2009 period was little affected by differences in housing market performance across states.[16] Displaced workers in Nevada, California, Florida, Arizona, and Michigan—which were among the 10 states to experience the largest decreases in a statewide housing price index—had almost the same likelihood of not moving after losing their jobs (90.7%) as displaced workers in the 10 states with the best housing markets (91.5%).[17]

Using monthly microdata from the Current Population Survey and an econometric model, Valletta found no evidence in favor of the house-lock argument. Because house lock would mean a longer period of job search in the local labor market for owners of homes whose values had decreased, he examined differences in unemployment durations between homeowners and renters across metropolitan areas differentiated by their degree of decreases in home prices. The results of his analysis do not support the hypothesis that reduced geographic mobility among homeowners contributed to high unemployment during the recession and through 2011.[18]

Alternatively, based on their construction of a model of metropolitan area housing and labor markets and migration, Karahan and Rhee concluded that house lock reduced geographic mobility and exacerbated the increase in unemployment during the Great (2007-2009)

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[13] Raven Molloy, Christopher L. Smith, and Abigail Wozniak, "Internal Migration in the United States," *Journal of Economic Perspectives*, vol. 25, no. 3 (Summer 2011), pp. 173-196.

[14] Greg Kaplan and Sam Schulhofer-Wohl, *Interstate Migration Has Fallen Less Than You Think: Consequences of Hot Deck Imputation in the Current Population Survey*, Federal Reserve Bank of Minneapolis Working Paper 681, November 2010.

[15] Daniel Aaronson and Jonathan Davis, "How Much Has House Lock Affected Labor Mobility and the Unemployment Rate?," *Chicago Fed Letter*, no. 290, September 2011.

[16] The authors used BLS's definition of displaced workers, namely, those aged 20 and older who lost their jobs after being on their employers' payrolls for at least three years prior to displacement.

[17] John Schmitt and Kris Warner, *Deconstructing Structural Unemployment*, Center for Economic and Policy Research, May 24, 2011.

[18] Robert G. Valletta, *House Lock and Structural Unemployment*, Federal Reserve Bank of San Francisco Working Paper no. 2012-25, revised November 2012.

Recession.[19] They estimated that, absent the housing bust, workers would have been more likely to move during the recession from areas with higher to lower unemployment rates (the migration rate would have risen). As a result, the decline in migration shown in the various data sources referenced above understated the impact of the sharp drop in house prices on worker mobility and unemployment. Geographic mismatch resulting from the housing bust may explain about 0.5 percentage points of the increase in the unemployment rate during the 2007-2009 recession, according to Karahan and Rhee.

Underemployment by Industry

Firms can adjust the quantity of labor they use in response to a decrease in aggregate demand not only by reducing the size of their work forces but also by cutting the hours of qualified employees they retain on their payrolls. The latter action produces "underemployment," that is, workers employed part-time who would prefer to be employed full-time but cannot for economic reasons (e.g., unfavorable business conditions).[20] Because underemployment reflects the demand for workers who possess the skills required to perform their jobs, analysis of changes in underemployment takes skill mismatch out of the equation.

The demand for qualified employees fell across every industry shown in **Figure 2**. The total number of underemployed workers slightly more than doubled over the three-year period to 8.9 million in 2010, when the unemployment rate reached its most recent peak.[21] Underemployment increased even more so in the following diverse group of industries: retail trade; social assistance; food services and drinking places; health care; accommodation; arts, entertainment, and recreation; educational services; and state government.

Jayadev and Konczal analyzed the trend in underemployment from 2000 to 2010 for the construction and financial activities industries, and for all other industries. They found that the number of persons involuntarily working fewer than 35 hours a week had about doubled for both the construction and financial activities industries and for all other industries since the outset of the 2007-2009 recession, which coincided with a financial crisis related to the collapse of the housing market. Jayadev and Konczal took this as "a sign that underemployment is hitting every sector, not just those with hangovers from the bubble."[22] In other words, they believe this indicates that cyclical forces have primarily affected the labor market.

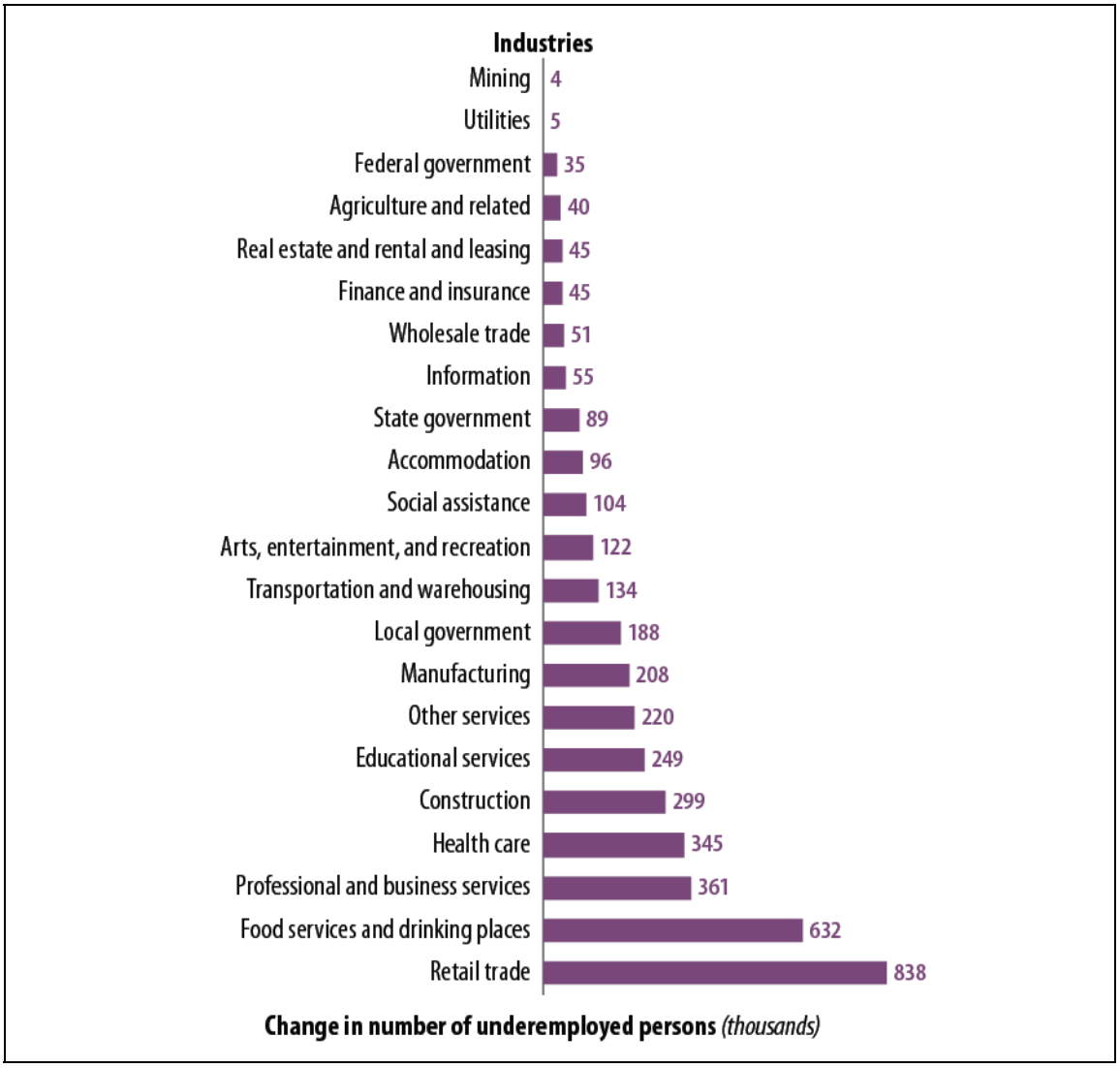
[19] Fatih Karahan and Serena Rhee, *Geographical Reallocation and Unemployment during the Great Recession: the Role of the Housing Bust*, University of Pennsylvania, 2011, available at http://economics.sas.upenn.edu/~karahan/JMP_Karahan.pdf.

[20] BLS defines a part-time work schedule as less than 35 hours a week.

[21] CRS calculations from Current Population Survey (CPS) data available at http://stats.bls.gov/cps/.

[22] Arjun Jayadev and Mike Konczal, *The Stagnating Labor Market*, The Roosevelt Institute, September 19, 2010, p. 8.

Figure 2. Change in the Number of Underemployed Workers by Industry, 2007-2010



Source: Created by CRS from the total number of workers employed part-time for economic reasons in 2007 and 2010 according to U.S. Bureau of Labor Statistics data from the Current Population Survey.

Notes: Underemployed workers want to work full time but are working part-time (1-34 hours a week) for an economic reason (e.g., their hours were cut back or they were unable to find full-time jobs).

The Hiring Rate by Industry and Region

The decrease in the hiring rate (i.e., the number of hires as a percent of total nonfarm employment) between 2007 and 2010 in almost all industries for which data are available from the Job Openings and Labor Turnover Survey (JOLTS) again suggests the primacy of cyclical over structural factors.[23] (See **Figure 3**.) Employers in less than half of these industries hired

[23] BLS, Job Openings and Labor Turnover Survey (JOLTS) data are available at http://stats.bls.gov/jlt/.

relatively more workers in 2010 than in 2009. Rates returned to pre-recession levels in only construction[24] and the federal government.[25]

Offshore outsourcing, by changing the skill mix of jobs into which U.S. workers can be hired, has been offered as a reason for the slow recovery of the labor market. The largest declines in the hiring rate between 2007 and 2010 were in industries in which the major occupations are not especially vulnerable to offshoring, however. (Offshorable occupations have been defined as those whose duties do not require in-person contact between employees and customers or those whose duties do not have to be performed in the United States.)[26] Cooks, food preparation and serving workers (including fast food), and waiters and waitresses are among the leading occupations in the accommodations and food services industry, in which the hiring rate plunged 27.6 percentage points as shown in **Figure 3**.[27] Amusement and recreation attendants, fitness trainers and aerobics instructors, and landscaping and groundskeeping workers account for the largest shares of workers in the arts, entertainment and recreation industry, which experienced the second biggest decrease in the rate of hires. Counter and rental clerks; general maintenance and repair workers; property, real estate, and community association managers; and real estate sales agents are among the leading occupations in the real estate and rental and leasing industry, just as cashiers, retail salespersons, stock clerks, and order fillers are in the retail trade industry. Although some jobs in the finance and insurance industry may be more vulnerable to offshoring than the aforementioned jobs in industries whose hiring rate fell most precipitously between 2007 and 2010, tellers—a non-offshorable occupation—comprise the largest share of the finance and insurance industry's employment.

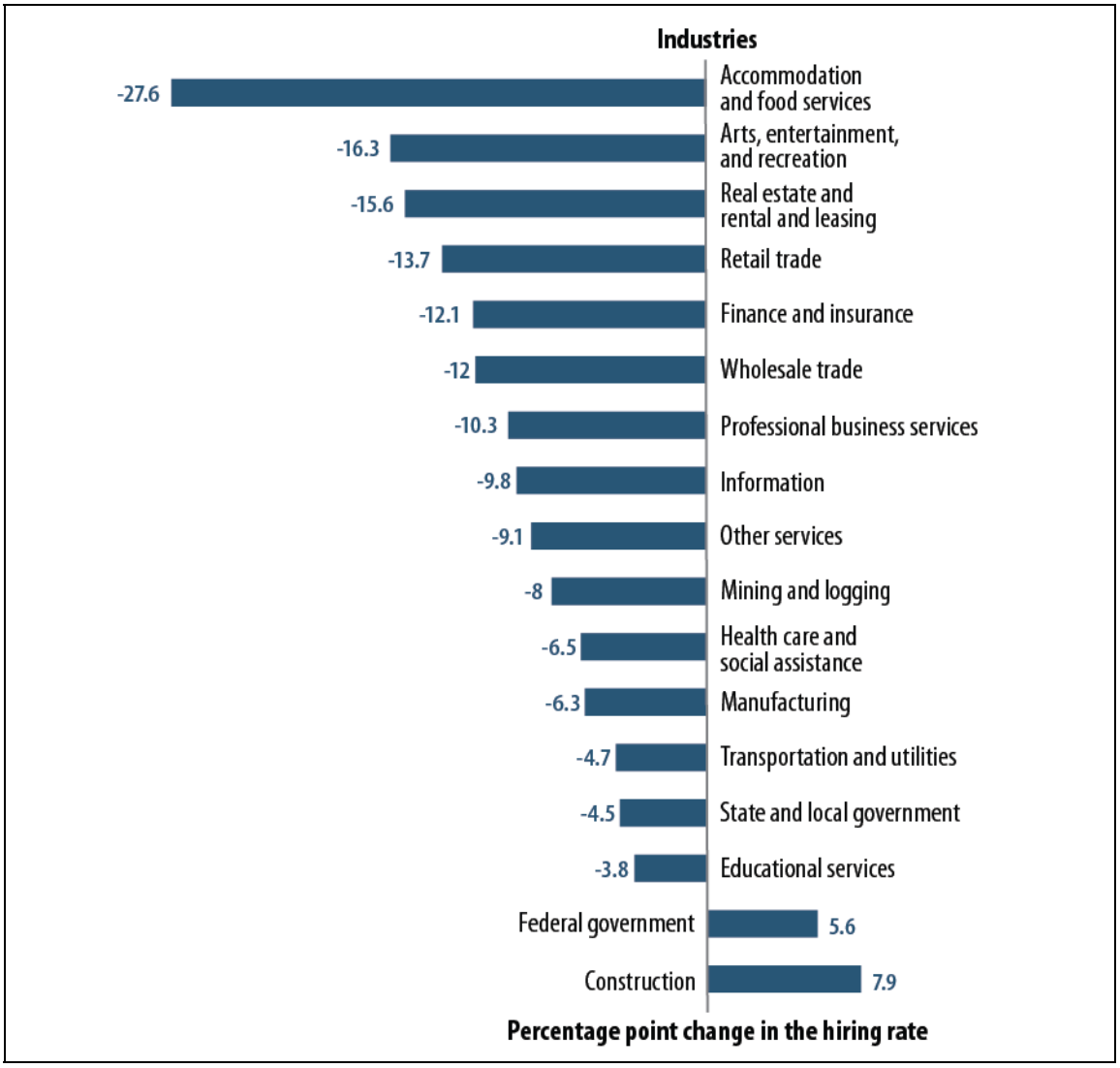
[24] Infrastructure spending included in the American Recovery and Reinvestment Act of 2009 may have given a boost to hiring in the heavy and civil engineering component of the construction industry (i.e., establishments whose primary activity is the construction of entire engineering projects, such as highways, and specialty trade contractors whose primary activity is the production of a specific component for such projects). The law's provisions to encourage energy conservation among homeowners also may have contributed to increased labor demand in 2010 in the specialty trade contractors component of the construction industry (e.g., firms that install prefabricated thermal-pane window units and energy-efficient heating/air-conditioning units).

[25] The hiring rate of the federal government surpassed its pre-recession level in part because the Census Bureau hired temporary workers to help conduct the 2010 decennial census. For additional information, see BLS, *Census 2010 Temporary Workers and Intermittent Workers and Federal Government Employment,* available at http://stats.bls.gov/ces/cescensusworkers.pdf; and *Impact of 2010 Census Operations on Jobs and Economic Growth*, available at http://www.esa.doc.gov/sites/default/files/reports/documents/economicgrowth.pdf.

[26] For additional information, see CRS Report RL32292, *Offshoring (or Offshore Outsourcing) and Job Loss Among U.S. Workers*, by Linda Levine.

[27] The distribution of employment by occupation within industries is from BLS's Occupational Employment Survey, which is available at http://stats.bls.gov/oes/.

Figure 3. Percentage Point Change in the Hiring Rate by Industry, 2007-2010



Source: Created by CRS from the hiring rate in 2007 and 2010 according to U.S. Bureau of Labor Statistics data from the Job Openings and Labor Turnover Survey.

Notes: The hiring rate is the number of hires during the entire year as a percent of annual average nonfarm employment.

Just as hiring activity fell in most industries between 2007 and 2010, so too did hires drop in all four geographic areas for which JOLTS data are available. The West and South recorded the largest declines in the hiring rate (i.e., each fell by 11.7 percentage points to 36.1% and 37.3%, respectively).[28] Both regions include states that are among the most hard hit by the end of the housing bubble (e.g., Nevada and Florida). In the Midwest, the hiring rate decreased by 8.5

[28] The West is composed of Alaska, Arizona, California, Colorado, Hawaii, Idaho, Montana, Nevada, New Mexico, Oregon, Utah, Washington, and Wyoming. The South is composed of Alabama, Arkansas, Delaware, District of Columbia, Florida, Georgia, Kentucky, Louisiana, Maryland, Mississippi, North Carolina, Oklahoma, South Carolina, Tennessee, Texas, Virginia, and West Virginia.

percentage points to 36.9% in 2010.[29] The Northeast's rate fell the least over the three-year period, decreasing by 4.7 percentage points to 34.3% in 2010.[30]

The Ratio of Unemployed Workers to Job Openings by Industry

The number of unemployed workers for every job opening (vacancy) increased during the 2007-2009 recession. From 1.8 unemployed workers per job opening at the recession's outset in December 2007, the ratio peaked at 6.7 in July 2009, one month after the recession ended.[31] In late 2010, there were still about five unemployed workers for every job vacancy. The ratio has fallen slowly since then.[32]

With so many more jobseekers than available jobs it seems fairly straightforward for employers to transform vacancies into hires. But, the mismatch argument posits that employers are having difficulty filling vacancies because the skills unemployed workers possess do not qualify them for the available positions. The number of experienced (i.e., qualified) unemployed workers per job opening increased in every industry through 2010, however, when the unemployment rate mostly recently peaked at 9.6%.[33] (See **Table 1**.)

Sahin, Song, Topa, and Violante estimated that the rise in industry-level mismatch does not account for much of the increase in the unemployment rate and that the rise in mismatch was short-lived. Their analysis indicates that the increase in mismatch across industries explained between 0.59 and 0.75 percentage points of the rise in U.S. unemployment from its average of 4.6% in 2006, to its peak of 10.0% in October 2009, "i.e., at most 14 percent of the increase."[34] In 2010, the mismatch between unemployed workers and job vacancies across industries started moving toward pre-recession levels.

To some observers, the much higher ratio of unemployed workers to job openings in the construction industry compared with other industries in 2010 and the much higher ratio in the construction industry during the current recovery compared with the recovery from the 2001 recession suggest an increase in structural unemployment.[35] The latest recession was partly caused by the bursting of the housing bubble, before which high demand for homes drove up construction employment and likely held down the industry's ratio during the recovery from the 2001 recession.[36] In addition, the existence of more qualified jobseekers than job openings in

[29] The Midwest is composed of Illinois, Indiana, Iowa, Kansas, Michigan, Minnesota, Missouri, Nebraska, North Dakota, Ohio, South Dakota, and Wisconsin.

[30] The Northeast is composed of Connecticut, Maine, Massachusetts, New Hampshire, New Jersey, New York, Pennsylvania, Rhode Island, and Vermont.

[31] CRS calculations from CPS and JOLTS data.

[32] In late 2012, there were about three jobless workers per opening.

[33] The CPS data on unemployment by industry cover persons previously employed in a given industry, which suggests that by-and-large they possessed the skills needed to qualify for the jobs they lost or left. The CPS data on unemployment discussed in the initial paragraph of this section cover all unemployed persons, that is, new entrants and reentrants to the labor force as well as persons who lost or left their jobs.

[34] Aysegul Sahin, Joseph Song, Giorgio Topa and Giovanni L. Violante, *Mismatch Unemployment*, September 2012, p. 20. It is a revised version of *Mismatch Unemployment,* National Bureau of Economic Research, Working Paper no. 18265, August 2012. (Hereinafter referred to as Sahin et al., *Mismatch Unemployment*.)

[35] See for example John Silvia and Anika Khan, "Our Two Cents on Structural Unemployment," *ABA Banking Journal*, November 2010.

[36] Kathryn J. Byun ("The U.S. Housing Bubble and Bust: Impacts on Employment," *Monthly Labor Review*, December (continued...)

every industry shown in **Table 1** suggests that an economy-wide reduction in demand rather than shifts in demand across industries is the greater contributor to the increase in unemployment. Lastly, even if many of the workers let go by residential building construction firms and residential specialty trade contractors face prolonged unemployment due to mismatch, the overall impact is likely to be limited because the two components of the construction industry accounted for only 2.4% of total nonfarm employment in 2005 (before the housing bubble burst).

Table 1. The Ratio of Experienced Unemployed Workers to Job Openings by Industry

Industry	Number of Experienced Unemployed Workers[a] Divided by Number of Job Openings[b]	
	December 2007	December 2010
Total private nonfarm industries	1.6	5.3
Mining and logging	1.3	3.7
Construction	9.7	51.4
Manufacturing	2.8	9.0
Wholesale and retail trade	1.8	7.7
Transportation and utilities	2.1	5.1
Information	1.5	3.4
Financial activities	1.2	3.0
Professional and business services	1.1	2.7
Education and health services	0.7	2.3
Leisure and hospitality	2.1	7.3
Other services	1.7	4.5
Government	1.1	2.6

Source: Calculated by CRS from Current Population Survey (CPS) and Job Openings and Labor Turnover Survey (JOLTS) data.

Notes: Comparable data on unemployment by industry from the CPS and on job openings by industry from JOLTS are available monthly on a not seasonally adjusted basis. When using not seasonally adjusted monthly data the appropriate comparison across time is month over year (e.g., December of 2007 and 2010).

a. Experienced unemployed workers in a given industry are those workers who were employed in that industry just prior to separation from their employers. Persons who became unemployed upon entering or reentering the labor force are excluded.

b. Job openings include only those positions for which employers are recruiting from outside their firms and for which work could start within 30 days regardless of when a suitable candidate is found.

Evidence of Somewhat Increased Structural Unemployment

Anomalies that occurred during the latest recession and ongoing recovery suggest that structural impediments to efficiently matching workers with jobs may have contributed more to the increase

(...continued)

2010) estimated that bubble-related demand accounted for between 1.2 million and 1.7 million residential-construction-related jobs in 2005 at the housing bubble's peak.

in the unemployment rate from 5.0% in December 2007 to a peak of 10.0% in October 2009 than they did during earlier fluctuations in the business cycle. These anomalies are the incidence of permanent job loss and of long-term unemployment as well as the nature of the relationship between unemployment and job vacancies. Most of the studies reviewed below estimated that any increase in structural unemployment in recent years accounted for a minority of the unemployment rate's rise, however. A few analyses further suggest that the recent increase in structural unemployment in the United States is unlikely to persist as occurred in some European countries starting in the 1980s and extending into the 1990s. Their conclusion that the U.S. labor market has not attained "a new normal" of high unemployment rates for years to come is partly due to the temporary nature of the Emergency Unemployment Compensation program enacted in 2008 and most recently extended by Congress through 2013.[37]

Permanent Job Loss and Long-Term Unemployment

"Two particularly worrisome signs suggestive of structural labor market problems ... are the concentration of the rise in unemployment among permanent job losers and the huge increase in long-term unemployment."[38] The unemployment rate may be higher than it otherwise would have been had the composition of unemployed workers not shifted toward the two hard-to-employ groups.

Workers who permanently lost their jobs (i.e., job losers *not* on temporary layoffs) grew from 1.7% of the labor force in 2007 to 5.1% in 2010, the year in which the unemployment rate most recently peaked.[39] In contrast, permanent job losers rose from 1.7% of the labor force in 1979 to just 4.0% in 1983 after the severe 1981-1982 recession.[40] Job losers' share of the labor force grew from 1.2% in 2000, before the start of the mild 2001 recession, to a much lower 2.6% in 2003 during the ensuing jobless recovery.

Temporary layoffs can be quickly reversed as the economy picks up steam, but job losses sever the employee-employer relationship and force job losers to search for new positions. Former employees of industries that may not soon see demand return to pre-recession levels (e.g., the residential construction industry) may experience especially lengthy unemployment if their skill sets do not match those of jobs in expanding sectors.[41]

More than six million workers were unemployed for longer than 27 weeks (i.e., the long-term unemployed) in 2010. They comprised over 40% of all workers unemployed in that and the two subsequent years. Earlier postwar peaks in the long-term unemployed's share of all unemployed

[37] For additional information, see CRS Report RS22915, *Temporary Extension of Unemployment Benefits: Emergency Unemployment Compensation (EUC08)*, by Katelin P. Isaacs and Julie M. Whittaker.

[38] Testimony of Lawrence F. Katz, Harvard University, on "Long-Term Unemployment in the Great Recession," in U.S. Congress, Joint Economic Committee, *Long-Term Unemployment: Causes, Consequences and Solutions*, 111th Cong., 2nd sess., April 29, 2010.

[39] Calculated by CRS from CPS data.

[40] There was also a brief recession in 1980.

[41] Some have speculated that other displaced workers, such as those formerly employed in the finance, insurance and real estate industries, may more easily find new jobs because their skills are more readily transferable to other industries than those of construction and manufacturing workers. See for example Ellen R. Rissman, "Employment Growth: Cyclical Movements or Structural Change?," *Federal Reserve Bank of Chicago Economic Perspectives*, 4th quarter 2009, pp. 40-57.

workers were about half as large.[42] The long-term unemployment rate (i.e., persons unemployed more than six months as a share of the labor force) was 4.2% in 2010. At no other time during the postwar period was long-term unemployment more prevalent.[43]

Shimer estimated that the probability of reemployment decreases the longer workers remain unemployed in either good or bad economic times, but he also found that recessions result in the largest percentage decrease in the job-finding probability of the long-term unemployed.[44] Although it is unclear why the long-term unemployed have more difficulty getting jobs, some speculate that firms are reluctant to hire those toward the end of the unemployment queue because their skills may have atrophied from lack of use.[45] The long-term unemployed's chances of reemployment may also be depressed if their unemployment stigmatizes them in employers' eyes. In addition, workers may become demoralized after being jobless for a very long time and as a result, search less intensively for jobs.

Lazear and Spletzer concluded that the 11th postwar recession was not unlike earlier recessions—except more severe—with cyclical (transitory) factors largely accounting for the still-elevated unemployment rate. They noted that the high prevalence of long-term unemployment is an atypical feature of the Great Recession which "is not due to any observed structural change, but rather to the depth of the current recession."[46]

The Vacancy Rate and the Unemployment Rate

Yet a third anomaly suggestive of structural problems in the labor market is the nature of the relationship between the job vacancy (openings) rate and the unemployment rate after the recession's end in June 2009. Historically, there has been a stable negative association over the course of the business cycle between the vacancy rate (i.e., vacancies as a percentage of all filled and unfilled jobs) and the unemployment rate.[47] During economic expansions when demand is strong (i.e., the vacancy rate is high), the unemployment rate is low. During economic contractions when demand is weak (i.e., the vacancy rate is low), the unemployment rate is high.

The inverse relationship between the job openings and unemployment rates was maintained during the 2007-2009 recession, but both rates have increased during much of the recovery period. The unemployment rate averaged 2.6 percentage points higher in the January-March 2012 period than the rate predicted by their historically inverse relationship, according to Barnichon, Elsby, Hobijn and Sahin.[48] They also estimated that the higher than predicted unemployment rate

[42] After the 1981-1982 recession, the long-term unemployed's share of total unemployment grew to 23.9%. Their share next peaked in 2003, at 22.1%, during the recovery from the 2001 recession.

[43] For additional information, see CRS Report R41179, *Long-Term Unemployment and Recessions*, by Gerald Mayer and Linda Levine.

[44] Robert Shimer, "The Probability of Finding a Job," *American Economic Review*, vol. 98, no. 2 (May 2008), pp. 268-273.

[45] Catherine Rampell, *Will Today's Unemployed Become Tomorrow's Unemployable?*, December 2, 2010, available at http://economix.blogs.nytimes.com.

[46] Edward P. Lazear and James R. Spletzer, *The United States Labor Market: Status Quo or A New Normal?*, Paper presented at the Jackson Hole symposium, July 22, 2012, p. 32.

[47] Mark deWolf and Katherine Klemmer, "Job Openings, Hires, and Separations Fall During the Recession," *Monthly Labor Review*, May 2010, pp. 36-44.

[48] Regis Barnichon et al., "Which Industries are Shifting the Beveridge Curve?," *Monthly Labor Review*, June 2012.

was mostly due to the unusually low rate at which workers were hired to fill vacancies given the stage of the business cycle. Although the economists estimated that the shortfall in hires was present in many industries, the construction industry was found to have contributed most to the overall shortfall. Daly, Hobijn, Sahin, and Valletta suggested that if half of the unusually large number of construction workers who remain unemployed were to find jobs in other industries as the recovery proceeds, "the decline of construction would cause structural unemployment to increase by only about 0.4 percentage point."[49]

Estimates of the Increase in Structural Unemployment

Several economists estimated how much structural unemployment increased and contributed to the steep rise of the unemployment rate from a pre-recession average of 4.6% in 2007 to 9.3% in 2009 and a still higher 9.6% in 2010. Most of the empirical studies whose results are summarized in **Table 2** relied to varying degrees on recent deviations from the above-described negative relationship between vacancy and unemployment rates and from the positive relationship between the job-finding rate and the vacancy-unemployment ratio. Another difference that may affect their results is the time period covered by the analyses (e.g., ending in 2009 or 2010).

Six of the seven studies estimated an increase in structural unemployment that accounted for a minority of the recent rise in the unemployment rate. The results of these analyses imply that the increase in structural unemployment may explain between 20% and 35% (or 1.0-1.75 percentage points) of the 5 percentage point increase in the unemployment rate between 2007 and 2010.

Table 2. Estimates of the Increase Since 2007 in the Structural Unemployment Rate

Percentage Point Increase in the Structural Unemployment Rate[a]	Author	Source
0.6-1.9, preferred estimate of 1.25	Mary Daly, Bart Hobijn, and Rob Valletta	The Recent Evolution of the Natural Rate of Unemployment, Federal Reserve Bank of San Francisco (FRBSF) Working Paper 2011-05, January 2011
1.0-1.75	Nicoletta Batini, Oya Celasun, Thomas Dowling, et al.	United States: Selected Issues Paper, International Monetary Fund, Country Report No. 10/248, July 2010
1.75	Marcello Estevao and Evridiki Tsounta	Has the Great Recession Raised U.S. Structural Unemployment?, IMF Working Paper 11/105, May 2011
1.7	Justin Weidner and John C. Williams	What Is the New Normal Unemployment Rate?, FRBSF Economic Letter 2011-05, February 14, 2011
1.5	Regis Barnichon and Andrew Figura	What Drives Movements in the Unemployment Rate?, Federal Reserve Board, Finance and Economics Discussion Series Working Paper 2010-48, August 20, 2010
2.5	Narayana Kocherlakota	Back Inside the FOMC, speech by the President of the Federal Reserve Bank of Minneapolis, September 8, 2010

Source: Created by CRS from the studies referenced in the table.

[49] Mary Daly, Bart Hobijn, and Aysegul Sahin, et al.,"A Search and Matching Approach to Labor Markets: Did the Natural Rate of Unemployment Rise?," *Journal of Economic Perspectives*, vol. 26, no. 3 (summer 2012), p. 20.

a. There is no officially calculated rate of structural unemployment. The nonaccelerating inflation rate of unemployment (NAIRU) is a proxy for the structural unemployment rate because the NAIRU (or natural rate) is estimated without regard to fluctuations in aggregate demand.

Researchers disagree on the precise allocation of the unemployment rate's rise to skill as opposed to geographic mismatch. This likely relates in part to the different measures of mismatch they developed. Batini, Celasun, Dowling et al. estimated that their measure of skill mismatch by state raised structural unemployment by 1.0-1.75 percentage points between 2007 and 2009. (See **Table 2**.) In contrast, Estevao and Tsounta found that unfavorable conditions in the housing market (which may have reduced geographic mobility) accounted for more of their estimated 1.75 percentage point increase in structural unemployment over the 2006-2010 period than did skill mismatch (1 percentage point and 0.5 percentage point, respectively). Estevao and Tsounta estimated that the remaining rise in structural unemployment (0.25 percentage points) was due to the interaction of skill match with foreclosures. For their part, Sahin et al. found that geographic mismatch did not play a role in the unemployment rate's increase from 4.6% on average in 2006 to its October 2009 peak (10.0%), whereas mismatch across occupations explained between 0.6 and 0.9 percentage point of the rise.[50] The analysis of Herz and van Rens gave comparatively more weight to geographic than skills mismatch: they estimated that mismatch across states accounted for 0.1 percentage point of the 5 percentage point increase in unemployment during the Great Recession compared to 0.03 percentage point for skill mismatch.[51] Although Daly, Hobijn, and Valletta found that mismatch accounted for a larger share (0.5 percentage points or less) of their preferred estimated increase of 1.25 percentage points in structural unemployment from 2007 to 2010, it nonetheless explained a minority of the increase.

Empirical estimates of the impact of unemployment benefit extensions on the rise in structural unemployment are about equal to those for mismatch.[52] Differences between the researchers' estimates with regard to unemployment benefits likely reflects variations in how they operationalized the explanatory variable. Daly, Hobijn, and Valletta estimated that the temporarily authorized federal Emergency Unemployment Compensation (EUC) program accounted for 0.8 percentage points of the increase in structural unemployment from 2007 to 2010. Valletta and Kuang initially estimated a 0.4 percentage point increase in structural unemployment due to unemployment benefit extensions,[53] but after updating the data to include all of 2009 and the first half of 2010, the researchers found the effect of the EUC program to be twice as large (0.8 percentage points). Still others put the contribution of unemployment benefit extensions to increased unemployment at 0.3 percentage points,[54] 0.7-0.8 percentage points,[55] and at somewhat over 1 percentage point.[56]

[50] Sahin et al., *Mismatch Unemployment*.

[51] Benedikt Herz and Thijs van Rens, *Structural Unemployment*, Barcelona Graduate School of Economics, Working Paper no. 568, July 2011, available at http://www.crei.cat/~vanrens/SU/HvR_SU_201107.pdf.

[52] The increase in the duration of benefit eligibility to a 99-week maximum may have raised the unemployment rate above what it otherwise would have been by either reducing the number of long-term unemployed exiting the labor force or by reducing their intensity of job search and thereby decreasing the likelihood of reemployment, or both. For information on the relationship between unemployment duration and benefit receipt, see CRS Report R41676, *The Effect of Unemployment Insurance on the Economy and the Labor Market*, by Thomas L. Hungerford.

[53] Robert G. Valletta and Katherine Kuang, *Extended Unemployment and UI Benefits*, FRBSF Economic Letter, No. 2010-12, April 19, 2010.

[54] Jesse Rothstein, *Unemployment Insurance and Job Search in the Great Recession*, National Bureau of Economic Research, Working Paper no. 17534, October 2011.

[55] Daniel Aaronson, Bhashkar Mazumder, and Shani Schechter, "What is Behind the Rise in Long-Term Unemployment?," *Federal Reserve Bank of Chicago Economic Perspectives*, 2nd quarter 2010; and Bhashkar (continued...)

Several analysts have speculated about whether the recent increase in structural unemployment will persist, thereby keeping the U.S. unemployment rate high for many years to come as occurred in some European countries from the 1980s into the 1990s.[57] Elsby, Hobijn, and Sahin stated that, despite the sharp decline in the U.S. job-finding rate, it remains well above the job-finding rates of many European countries that experienced a prolonged period of elevated structural unemployment starting in the 1980s.[58] While noting that their analysis does not suggest how long the 1.0-1.75 percentage point increase in structural unemployment due to mismatch will last, Batini, Celasun, Dowling et al. mentioned a distinctive feature of the U.S. economy—flexibility[59]—which may allow the United States to avoid stubbornly high unemployment rates for years to come.[60] Daly, Hobijn, and Valletta concluded that little of their 1.25 percentage point increase in structural unemployment is likely to persist "as labor market conditions improve [in the United States] and the extended UI provisions are allowed to expire."[61]

Taking into account changes over time in unemployment benefit programs and product market regulations, Guichard and Rusticelli estimated substantial differences in the vulnerability to structural unemployment increases among Organisation for Economic Cooperation and Development (OECD) nations.[62] Regardless of the unemployment effect of the financial crisis in the 28 OECD economies included in their 2010 study, Guichard and Rusticelli estimated that the United States may be less vulnerable than 20 nations to an increase in structural unemployment over the 2007-2012 period. Of the 10 OECD countries that experienced the largest unemployment impact from the recent financial crisis, they estimated that the United States was among the nations least vulnerable to an increase in structural unemployment.

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Mazumder, "How Did Unemployment Insurance Extensions Affect the Unemployment Rate in 2008-10?," *Chicago Fed Letter*, No. 285, April 2011.

[56] Shigeru Fujita, *Effects of Extended Unemployment Insurance Benefits: Evidence from the Monthly CPS*, Federal Reserve Bank of Philadelphia, Working Paper no. 10-35/R, January 2011; Steven D. Mullins, "The Unemployment Impact of the 2008 Extension of Unemployment Insurance: As High as Robert Barro Suggested?," *Economic Journal Watch*, vol. 9, no. 1, January 2012; and Makoto Nakajima, *A Quantitative Analysis of Unemployment Benefit Extension,*, Federal Reserve Bank of Philadelphia, Working Paper no. 11-8, February 8, 2011.

[57] For a discussion of institutional and other factors estimated to have led to inter-country differences in structural unemployment, see *Structural Unemployment in Western Europe*, ed. Martin Werding (Cambridge, MA: MIT Press, 2006).

[58] Michael W. Elsby, Bart Hobijn, and Aysegul Sahin, *The Labor Market in the Great Recession*, National Bureau of Economic Research, Working Paper no. 15979, May 2010. For the Brookings Panel on Economic Activity in September 2011, they along with Robert G. Valletta prepared *The Labor Market in the Great Recession: An Update,* dated October 2011, which was released by the Tinbergen Institute as Discussion Paper 2011-173/3.

[59] Structural unemployment rates vary across countries depending in part on differences in their labor market institutions or settings. The U.S. labor market is considered to be less rigid (more flexible) than that of many European countries partly because it's much lower unionization rate allows wages to adjust more quickly to economic shocks. Similarly, the relatively less generous unemployment insurance programs and lower public spending on active labor market programs (e.g., retraining) in the United States create smaller disincentives to job search among U.S. compared with European workers. See, for example, Sven Jari Stehn, "Only a Modest Rise in Structural Unemployment So Far," *US Economics Analyst Issue No.: 10/34*, Goldman Sachs Global ECS US Research, August 27, 2010.

[60] Nicoletta Batini et al., *United States: Selected Issues Paper*, International Monetary Fund, Country Report No. 10/248, Washington, DC, July 2010, available at http://www.imf.org/external/pubs/ft/scr/2010/cr10248.pdf.

[61] Mary Daly, Bart Hobijn, and Rob Valletta, *The Recent Evolution of the Natural Rate of Unemployment*, FRBSF, Working Paper no. 2011-05, January 2011, p. 21.

[62] Stephanie Guichard and Elena Rusticelli, *Assessing the Impact of the Financial Crisis on Structural Unemployment in OECD Countries*, OECD, Economic Department Working Paper no. 767, Paris, France, October 14, 2010.

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